SEQUENCE LISTING

<110> Piddington, Christopher S.
      Petrie, Charles
      Shoemaker, Kimberly E.
      Bishop, Paul D.

<120> ZACE2: A HUMAN METALLOENZYME

<130> 99-24C1

<150> 60/133,952
<151> 1999-05-13

<150> 60/151,181
<151> 1999-08-27

<150> 09/563,516
<151> 2000-05-03

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Leu Leu Ser Leu Val Ala Val Thr Ala Ala Gln Ser Thr Ile Glu Glu
        10   15   20

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cag gcc aag aca ttt ttg gac aag ttt aac cac gaa gcc gaa gac ctg      151
Gln Ala Lys Thr Phe Leu Asp Lys Phe Asn His Glu Ala Glu Asp Leu
        25                  30                  35

ttc tat caa agt tca ctt gct tct tgg aat tat aac acc aat att act      199
Phe Tyr Gln Ser Ser Leu Ala Ser Trp Asn Tyr Asn Thr Asn Ile Thr
 40                  45                  50                  55

gaa gag aat gtc caa aac atg aat aat gct ggg gac aaa tgg tct gcc      247
Glu Glu Asn Val Gln Asn Met Asn Asn Ala Gly Asp Lys Trp Ser Ala
                    60                  65                  70

ttt tta aag gaa cag tcc aca ctt gcc caa atg tat cca cta caa gaa      295
Phe Leu Lys Glu Gln Ser Thr Leu Ala Gln Met Tyr Pro Leu Gln Glu
                75                  80                  85

att cag aat ctc aca gtc aag ctt cag ctg cag gct ctt cag caa aat      343
Ile Gln Asn Leu Thr Val Lys Leu Gln Leu Gln Ala Leu Gln Gln Asn
            90                  95                  100

ggg tct tca gtg ctc tca gaa gac aag agc aaa cgg ttg aac aca att      391
Gly Ser Ser Val Leu Ser Glu Asp Lys Ser Lys Arg Leu Asn Thr Ile
        105                 110                 115

cta aat aca atg agc acc atc tac agt act gga aaa gtt tgt aac cca      439
Leu Asn Thr Met Ser Thr Ile Tyr Ser Thr Gly Lys Val Cys Asn Pro
120                 125                 130                 135

gat aat cca caa gaa tgc tta tta ctt gaa cca ggt ttg aat gaa ata      487
Asp Asn Pro Gln Glu Cys Leu Leu Leu Glu Pro Gly Leu Asn Glu Ile
                    140                 145                 150

atg gca aac agt tta gac tac aat gag agg ctc tgg gct tgg gaa agc      535
Met Ala Asn Ser Leu Asp Tyr Asn Glu Arg Leu Trp Ala Trp Glu Ser
                    155                 160                 165

tgg aga tct gag gtc ggc aag cag ctg agg cca tta tat gaa gag tat      583
Trp Arg Ser Glu Val Gly Lys Gln Leu Arg Pro Leu Tyr Glu Glu Tyr
                170                 175                 180

gtg gtc ttg aaa aat gag atg gca aga gca aat cat tat gag gac tat      631
Val Val Leu Lys Asn Glu Met Ala Arg Ala Asn His Tyr Glu Asp Tyr
        185                 190                 195
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ggg gat tat tgg aga gga gac tat gaa gta aat ggg gta gat ggc tat   679
Gly Asp Tyr Trp Arg Gly Asp Tyr Glu Val Asn Gly Val Asp Gly Tyr
200   205   210   215

gac tac agc cgc ggc cag ttg att gaa gat gtg gaa cat acc ttt gaa   727
Asp Tyr Ser Arg Gly Gln Leu Ile Glu Asp Val Glu His Thr Phe Glu
              220   225   230

gag att aaa cca tta tat gaa cat ctt cat gcc tat gtg agg gca aag   775
Glu Ile Lys Pro Leu Tyr Glu His Leu His Ala Tyr Val Arg Ala Lys
          235   240   245

ttg atg aat gcc tat cct tcc tat atc agt cca att gga tgc ctc cct   823
Leu Met Asn Ala Tyr Pro Ser Tyr Ile Ser Pro Ile Gly Cys Leu Pro
         250   255   260

gct cat ttg ctt ggt gat atg tgg ggt aga ttt tgg aca aat ctg tac   871
Ala His Leu Leu Gly Asp Met Trp Gly Arg Phe Trp Thr Asn Leu Tyr
     265   270   275

tct ttg aca gtt ccc ttt gga cag aaa cca aac ata gat gtt act gat   919
Ser Leu Thr Val Pro Phe Gly Gln Lys Pro Asn Ile Asp Val Thr Asp
280   285   290   295

gca atg gtg gac cag gcc tgg gat gca cag aga ata ttc aag gag gcc   967
Ala Met Val Asp Gln Ala Trp Asp Ala Gln Arg Ile Phe Lys Glu Ala
              300   305   310

gag aag ttc ttt gta tct gtt ggt ctt cct aat atg act caa gga ttc   1015
Glu Lys Phe Phe Val Ser Val Gly Leu Pro Asn Met Thr Gln Gly Phe
         315   320   325

tgg gaa aat tcc atg cta acg gac cca gga aat gtt cag aaa gca gtc   1063
Trp Glu Asn Ser Met Leu Thr Asp Pro Gly Asn Val Gln Lys Ala Val
         330   335   340

tgc cat ccc aca gct tgg gac ctg ggg aag ggc gac ttc agg atc ctt   1111
Cys His Pro Thr Ala Trp Asp Leu Gly Lys Gly Asp Phe Arg Ile Leu
         345   350   355

atg tgc aca aag gtg aca atg gac gac ttc ctg aca gct cat cat gag   1159

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Met Cys Thr Lys Val Thr Met Asp Asp Phe Leu Thr Ala His His Glu
360             365             370             375

atg ggg cat atc cag tat gat atg gca tat gct gca caa cct ttt ctg    1207
Met Gly His Ile Gln Tyr Asp Met Ala Tyr Ala Ala Gln Pro Phe Leu
                380             385             390

cta aga aat gga gct aat gaa gga ttc cat gaa gct gtt ggg gaa atc    1255
Leu Arg Asn Gly Ala Asn Glu Gly Phe His Glu Ala Val Gly Glu Ile
                395             400             405

atg tca ctt tct gca gcc aca cct aag cat tta aaa tcc att ggt ctt    1303
Met Ser Leu Ser Ala Ala Thr Pro Lys His Leu Lys Ser Ile Gly Leu
            410             415             420

ctg tca ccc gat ttt caa gaa gac aat gaa aca gaa ata aac ttc ctg    1351
Leu Ser Pro Asp Phe Gln Glu Asp Asn Glu Thr Glu Ile Asn Phe Leu
            425             430             435

ctc aaa caa gca ctc acg att gtt ggg act ctg cca ttt act tac atg    1399
Leu Lys Gln Ala Leu Thr Ile Val Gly Thr Leu Pro Phe Thr Tyr Met
440             445             450             455

tta gag aag tgg agg tgg atg gtc ttt aaa ggg gaa att ccc aaa gac    1447
Leu Glu Lys Trp Arg Trp Met Val Phe Lys Gly Glu Ile Pro Lys Asp
                460             465             470

cag tgg atg aaa aag tgg tgg gag atg aag cga gag ata gtt ggg gtg    1495
Gln Trp Met Lys Lys Trp Trp Glu Met Lys Arg Glu Ile Val Gly Val
                475             480             485

gtg gaa cct gtg ccc cat gat gaa aca tac tgt gac ccc gca tct ctg    1543
Val Glu Pro Val Pro His Asp Glu Thr Tyr Cys Asp Pro Ala Ser Leu
                490             495             500

ttc cat gtt tct aat gat tac tca ttc att cga tat tac aca agg acc    1591
Phe His Val Ser Asn Asp Tyr Ser Phe Ile Arg Tyr Tyr Thr Arg Thr
            505             510             515

ctt tac caa ttc cag ttt caa gaa gca ctt tgt caa gca gct aaa cat    1639
Leu Tyr Gln Phe Gln Phe Gln Glu Ala Leu Cys Gln Ala Ala Lys His
520             525             530             535
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gaa ggc cct ctg cac aaa tgt gac atc tca aac tct aca gaa gct gga    1687
Glu Gly Pro Leu His Lys Cys Asp Ile Ser Asn Ser Thr Glu Ala Gly
            540             545                 550

cag aaa ctg ttc aat atg ctg agg ctt gga aaa tca gaa ccc tgg acc    1735
Gln Lys Leu Phe Asn Met Leu Arg Leu Gly Lys Ser Glu Pro Trp Thr
            555             560                 565

cta gca ttg gaa aat gtt gta gga gca aag aac atg aat gta agg cca    1783
Leu Ala Leu Glu Asn Val Val Gly Ala Lys Asn Met Asn Val Arg Pro
            570             575             580

ctg ctc aac tac ttt gag ccc tta ttt acc tgg ctg aaa gac cag aac    1831
Leu Leu Asn Tyr Phe Glu Pro Leu Phe Thr Trp Leu Lys Asp Gln Asn
            585             590             595

aag aat tct ttt gtg gga tgg agt acc gac tgg agt cca tat gca gac    1879

Lys Asn Ser Phe Val Gly Trp Ser Thr Asp Trp Ser Pro Tyr Ala Asp
600             605             610                 615

caa agc atc aaa gtg agg ata agc cta aaa tca gct ctt gga gat aaa    1927
Gln Ser Ile Lys Val Arg Ile Ser Leu Lys Ser Ala Leu Gly Asp Lys
            620             625             630

gca tat gaa tgg aac gac aat gaa atg tac ctg ttc cga tca tct gtt    1975
Ala Tyr Glu Trp Asn Asp Asn Glu Met Tyr Leu Phe Arg Ser Ser Val
            635             640             645

gca tat gct atg agg cag tac ttt tta aaa gta aaa aat cag atg att    2023
Ala Tyr Ala Met Arg Gln Tyr Phe Leu Lys Val Lys Asn Gln Met Ile
            650             655             660

ctt ttt ggg gag gag gat gtg cga gtg gct aat ttg aaa cca aga atc    2071
Leu Phe Gly Glu Glu Asp Val Arg Val Ala Asn Leu Lys Pro Arg Ile
            665             670             675

tcc ttt aat ttc ttt gtc act gca cct aaa aat gtg tct gat atc att    2119
Ser Phe Asn Phe Phe Val Thr Ala Pro Lys Asn Val Ser Asp Ile Ile
680             685             690                 695

cct aga act gaa gtt gaa aag gcc atc agg atg tcc cgg agc cgt atc    2167
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Pro Arg Thr Glu Val Glu Lys Ala Ile Arg Met Ser Arg Ser Arg Ile
            700                 705             710


aat gat gct ttc cgt ctg aat gac aac agc cta gag ttt ctg ggg ata     2215
Asn Asp Ala Phe Arg Leu Asn Asp Asn Ser Leu Glu Phe Leu Gly Ile
            715                 720             725


cag cca aca ctt gga cct cct aac cag ccc cct gtt tcc ata tgg ctg     2263
Gln Pro Thr Leu Gly Pro Pro Asn Gln Pro Pro Val Ser Ile Trp Leu
            730                 735             740


att gtt ttt gga gtt gtg atg gga gtg ata gtg gtt ggc att gtc atc     2311
Ile Val Phe Gly Val Val Met Gly Val Ile Val Val Gly Ile Val Ile
            745                 750             755


ctg atc ttc act ggg atc aga gat cgg aag aag aaa aat aaa gca aga     2359
Leu Ile Phe Thr Gly Ile Arg Asp Arg Lys Lys Lys Asn Lys Ala Arg
760                 765             770             775


agt gga gaa aat cct tat gcc tcc atc gat att agc aaa gga gaa aat     2407
Ser Gly Glu Asn Pro Tyr Ala Ser Ile Asp Ile Ser Lys Gly Glu Asn
                    780             785             790


aat cca gga ttc caa aac act gat gat gtt cag acc tcc ttt             2449
Asn Pro Gly Phe Gln Asn Thr Asp Asp Val Gln Thr Ser Phe
            795                 800             805


tagaaaaatc tatgtttttc ctcttgaggt gattttgttg tatgtaaatg ttaatttcat   2509
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gaaaaaaaat tgtccaaaga caacatggcc aaggagagag catcttcatt gacattgctt   2629
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gtacccagtc tcttaaatct tttgtatttg ctcacagtgt ttgagcagtg ctgagcacaa   3289
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    20   25   30

Asn His Glu Ala Glu Asp Leu Phe Tyr Gln Ser Ser Leu Ala Ser Trp
    35   40   45

Asn Tyr Asn Thr Asn Ile Thr Glu Glu Asn Val Gln Asn Met Asn Asn
    50   55   60

Ala Gly Asp Lys Trp Ser Ala Phe Leu Lys Glu Gln Ser Thr Leu Ala
65   70   75   80

Gln Met Tyr Pro Leu Gln Glu Ile Gln Asn Leu Thr Val Lys Leu Gln
            85   90   95

Leu Gln Ala Leu Gln Gln Asn Gly Ser Ser Val Leu Ser Glu Asp Lys
            100   105   110

Ser Lys Arg Leu Asn Thr Ile Leu Asn Thr Met Ser Thr Ile Tyr Ser
            115   120   125

Thr Gly Lys Val Cys Asn Pro Asp Asn Pro Gln Glu Cys Leu Leu Leu
    130   135   140

Glu Pro Gly Leu Asn Glu Ile Met Ala Asn Ser Leu Asp Tyr Asn Glu
145   150   155   160

Arg Leu Trp Ala Trp Glu Ser Trp Arg Ser Glu Val Gly Lys Gln Leu
            165   170   175

Arg Pro Leu Tyr Glu Glu Tyr Val Val Leu Lys Asn Glu Met Ala Arg
            180   185   190

Ala Asn His Tyr Glu Asp Tyr Gly Asp Tyr Trp Arg Gly Asp Tyr Glu
            195   200   205

Val Asn Gly Val Asp Gly Tyr Asp Tyr Ser Arg Gly Gln Leu Ile Glu
    210   215   220

Asp Val Glu His Thr Phe Glu Glu Ile Lys Pro Leu Tyr Glu His Leu
225   230   235   240

His Ala Tyr Val Arg Ala Lys Leu Met Asn Ala Tyr Pro Ser Tyr Ile
            245   250   255

Ser Pro Ile Gly Cys Leu Pro Ala His Leu Leu Gly Asp Met Trp Gly
            260   265   270

Arg Phe Trp Thr Asn Leu Tyr Ser Leu Thr Val Pro Phe Gly Gln Lys
    275   280   285

Pro Asn Ile Asp Val Thr Asp Ala Met Val Asp Gln Ala Trp Asp Ala
290   295   300

Gln Arg Ile Phe Lys Glu Ala Glu Lys Phe Phe Val Ser Val Gly Leu
305   310   315   320

Pro Asn Met Thr Gln Gly Phe Trp Glu Asn Ser Met Leu Thr Asp Pro
325   330   335

Gly Asn Val Gln Lys Ala Val Cys His Pro Thr Ala Trp Asp Leu Gly
340   345   350

Lys Gly Asp Phe Arg Ile Leu Met Cys Thr Lys Val Thr Met Asp Asp
355   360   365

Phe Leu Thr Ala His His Glu Met Gly His Ile Gln Tyr Asp Met Ala
370   375   380

Tyr Ala Ala Gln Pro Phe Leu Leu Arg Asn Gly Ala Asn Glu Gly Phe
385   390   395   400

His Glu Ala Val Gly Glu Ile Met Ser Leu Ser Ala Ala Thr Pro Lys
405   410   415

His Leu Lys Ser Ile Gly Leu Leu Ser Pro Asp Phe Gln Glu Asp Asn
420   425   430

Glu Thr Glu Ile Asn Phe Leu Leu Lys Gln Ala Leu Thr Ile Val Gly
435   440   445

Thr Leu Pro Phe Thr Tyr Met Leu Glu Lys Trp Arg Trp Met Val Phe
450   455   460

Lys Gly Glu Ile Pro Lys Asp Gln Trp Met Lys Lys Trp Trp Glu Met
465   470   475   480

Lys Arg Glu Ile Val Gly Val Val Glu Pro Val Pro His Asp Glu Thr
485   490   495

Tyr Cys Asp Pro Ala Ser Leu Phe His Val Ser Asn Asp Tyr Ser Phe
500   505   510

Ile Arg Tyr Tyr Thr Arg Thr Leu Tyr Gln Phe Gln Phe Gln Glu Ala
515   520   525

Leu Cys Gln Ala Ala Lys His Glu Gly Pro Leu His Lys Cys Asp Ile
530   535   540

Ser Asn Ser Thr Glu Ala Gly Gln Lys Leu Phe Asn Met Leu Arg Leu
545   550   555   560

Gly Lys Ser Glu Pro Trp Thr Leu Ala Leu Glu Asn Val Val Gly Ala
565   570   575

Lys Asn Met Asn Val Arg Pro Leu Leu Asn Tyr Phe Glu Pro Leu Phe
580   585   590

Thr Trp Leu Lys Asp Gln Asn Lys Asn Ser Phe Val Gly Trp Ser Thr
595   600   605

Asp Trp Ser Pro Tyr Ala Asp Gln Ser Ile Lys Val Arg Ile Ser Leu
610   615   620

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Lys Ser Ala Leu Gly Asp Lys Ala Tyr Glu Trp Asn Asp Asn Glu Met
625                 630             635             640
Tyr Leu Phe Arg Ser Ser Val Ala Tyr Ala Met Arg Gln Tyr Phe Leu
            645             650             655
Lys Val Lys Asn Gln Met Ile Leu Phe Gly Glu Glu Asp Val Arg Val
            660             665             670
Ala Asn Leu Lys Pro Arg Ile Ser Phe Asn Phe Phe Val Thr Ala Pro
            675             680             685
Lys Asn Val Ser Asp Ile Ile Pro Arg Thr Glu Val Glu Lys Ala Ile
    690             695             700
Arg Met Ser Arg Ser Arg Ile Asn Asp Ala Phe Arg Leu Asn Asp Asn
705             710             715             720
Ser Leu Glu Phe Leu Gly Ile Gln Pro Thr Leu Gly Pro Pro Asn Gln
            725             730             735
Pro Pro Val Ser Ile Trp Leu Ile Val Phe Gly Val Val Met Gly Val
            740             745             750
Ile Val Val Gly Ile Val Ile Leu Ile Phe Thr Gly Ile Arg Asp Arg
            755             760             765
Lys Lys Lys Asn Lys Ala Arg Ser Gly Glu Asn Pro Tyr Ala Ser Ile
    770             775             780
Asp Ile Ser Lys Gly Glu Asn Asn Pro Gly Phe Gln Asn Thr Asp Asp
785             790             795             800
Val Gln Thr Ser Phe
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<221> misc_feature
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taycarwsnw snytngcnws ntggaaytay aayacnaaya thacngarga raaygtncar     180
aayatgaaya aygcnggnga yaartggwsn gcnttyytna argarcarws nacnytngcn     240
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caratgtayc cnytncarga rathcaraay ytnacngtna arytncaryt ncargcnytn    300
carcaraayg gnwsnwsngt nytnwsngar gayaarwsna armgnytnaa yacnathytn     360
aayacnatgw snacnathta ywsnacnggn aargtntgya ayccngayaa yccncargar    420
tgyytnytny tngarccngg nytnaaygar athatggcna aywsnytnga ytayaaygar    480
mgnytntggg cntgggarws ntggmgnwsn gargtnggna arcarytnmg nccnytntay    540
gargartayg tngtnytnaa raaygaratg gcnmgngcna aycaytayga rgaytayggn    600
gaytaytggm gnggngayta ygargtnaay gggngtngayg gntaygayta ywsnmgnggn   660
carytnathg argaygtnga rcayacntty gargaratha arccnytnta ygarcayytn   720
caygcntayg tnmgngcnaa rytnatgaay gcntayccnw sntayathws nccnathggn    780
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gcntgggayg cncarmgnat httyaargar gcngaraart tyttygtnws ngtnggnytn    960
ccnaayatga cncarggntt ytgggaraay wsnatgytna cngayccngg naaygtncar   1020
aargcngtnt gycayccnac ngcntgggay ytnggnaarg gngayttymg nathytnatg   1080
tgyacnaarg tnacnatgga ygayttyytn acngcncayc aygaratggg ncayathcar   1140
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caygargcng tnggngarat hatgwsnytn wsngcngcna cnccnaarca yytnaarwsn    1260
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tayytnttym gnwsnwsngt ngcntaygcn atgmgncart ayttyytnaa rgtnaaraay    1980
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garaagcna thmgnatgws nmgnwsnmgn athaaygayg cnttymgnyt naaygayaay    2160
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athttyacng gnathmgnga ymgnaaraar aaraayaarg cnmgnwsngg ngaraayccn   2340
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<213> Artificial Sequence
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<212> DNA
<213> Mouse

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                                                    Met Ser Ser Ser
                                                     1

tcc tgg ctc ctt ctc agc ctt gtt gct gtt act act gct cag tcc ctc   165
Ser Trp Leu Leu Leu Ser Leu Val Ala Val Thr Thr Ala Gln Ser Leu
 5   10   15   20

acc gag gaa aat gcc aag aca ttt tta aac aac ttt aat cag gaa gct   213
Thr Glu Glu Asn Ala Lys Thr Phe Leu Asn Asn Phe Asn Gln Glu Ala
                25   30   35

gaa gac ctg tct tat caa agt tca ctt gct tct tgg aat tat aat act   261
Glu Asp Leu Ser Tyr Gln Ser Ser Leu Ala Ser Trp Asn Tyr Asn Thr
                40   45   50

aac att act gaa gaa aat gcc caa aag atg agt gag gct gca gcc aaa   309
Asn Ile Thr Glu Glu Asn Ala Gln Lys Met Ser Glu Ala Ala Ala Lys
            55   60   65

tgg tct gcc ttt tat gaa gaa cag tct aag act gcc caa agt ttc tca   357
Trp Ser Ala Phe Tyr Glu Glu Gln Ser Lys Thr Ala Gln Ser Phe Ser
 70   75   80

cta caa gaa atc cag act ccg atc atc aag cgt caa cta cag gcc ctt   405

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Leu Gln Glu Ile Gln Thr Pro Ile Ile Lys Arg Gln Leu Gln Ala Leu
85              90              95                  100


cag caa agt ggg tct tca gca ctc tca gca gac aag aac aaa cag ttg      453
Gln Gln Ser Gly Ser Ser Ala Leu Ser Ala Asp Lys Asn Lys Gln Leu
                105             110             115


aac aca att ctg aac acc atg agc acc att tac agt act gga aaa gtt      501
Asn Thr Ile Leu Asn Thr Met Ser Thr Ile Tyr Ser Thr Gly Lys Val
                120             125             130


tgc aac cca aag aac cca caa gaa tgc tta tta ctt gag cca gga ttg      549
Cys Asn Pro Lys Asn Pro Gln Glu Cys Leu Leu Leu Glu Pro Gly Leu
            135             140             145


gat gaa ata atg gcg aca agc aca gac tac aac tct agg ctc tgg gca      597
Asp Glu Ile Met Ala Thr Ser Thr Asp Tyr Asn Ser Arg Leu Trp Ala
        150             155             160


tgg gag ggc tgg agg gct gag gtt ggc aag cag ctg agg ccg ttg tat      645
Trp Glu Gly Trp Arg Ala Glu Val Gly Lys Gln Leu Arg Pro Leu Tyr
165             170             175             180


gaa gag tat gtg gtc ctg aaa aac gag atg gca aga gca aac aat tat      693
Glu Glu Tyr Val Val Leu Lys Asn Glu Met Ala Arg Ala Asn Asn Tyr
                185             190             195


aac gac tat ggg gat tat tgg aga ggg gac tat gaa gca gag gga gca      741
Asn Asp Tyr Gly Asp Tyr Trp Arg Gly Asp Tyr Glu Ala Glu Gly Ala
            200             205             210


gat ggc tac aac tat aac cgt aac cag ttg att gaa gat gta gaa cgt      789
Asp Gly Tyr Asn Tyr Asn Arg Asn Gln Leu Ile Glu Asp Val Glu Arg
        215             220             225


acc ttc gca gag atc aag cca ttg tat gag cat ctt cat gcc tat gtg      837
Thr Phe Ala Glu Ile Lys Pro Leu Tyr Glu His Leu His Ala Tyr Val
    230             235             240


agg agg aag ttg atg gat acc tac cct tcc tac atc agc ccc act gga      885
Arg Arg Lys Leu Met Asp Thr Tyr Pro Ser Tyr Ile Ser Pro Thr Gly
245             250             255             260
```

```
tgc ctc cct gcc cat ttg ctt ggt gat atg tgg ggt aga ttt tgg aca        933
Cys Leu Pro Ala His Leu Leu Gly Asp Met Trp Gly Arg Phe Trp Thr
            265                 270             275


aat ctg tac cct ttg act gtt ccc ttt gca cag aaa cca aac ata gat        981
Asn Leu Tyr Pro Leu Thr Val Pro Phe Ala Gln Lys Pro Asn Ile Asp
            280                 285             290


gtt act gat gca atg atg aat cag ggc tgg gat gca gaa agg ata ttt       1029
Val Thr Asp Ala Met Met Asn Gln Gly Trp Asp Ala Glu Arg Ile Phe
            295                 300             305


caa gag gca gag aaa ttc ttt gtt tct gtt ggc ctt cct cat atg act       1077
Gln Glu Ala Glu Lys Phe Phe Val Ser Val Gly Leu Pro His Met Thr
       310                 315             320


caa gga ttc tgg gca aac tct atg ctg act gag cca gca gat ggc cgg       1125
Gln Gly Phe Trp Ala Asn Ser Met Leu Thr Glu Pro Ala Asp Gly Arg
325                 330             335                 340


aaa gtt gtc tgc cac ccc aca gct tgg gat ctg gga cac gga gac ttc       1173
Lys Val Val Cys His Pro Thr Ala Trp Asp Leu Gly His Gly Asp Phe
                345                 350             355


aga atc aag atg tgt aca aag gtc aca atg gac aac ttc ttg aca gcc       1221
Arg Ile Lys Met Cys Thr Lys Val Thr Met Asp Asn Phe Leu Thr Ala
            360                 365             370


cat cac gag atg gga cac atc caa tat gac atg gca tat gcc agg caa       1269
His His Glu Met Gly His Ile Gln Tyr Asp Met Ala Tyr Ala Arg Gln
            375                 380             385


cct ttc ctg cta aga aac gga gcc aat gaa ggg ttc cat gaa gct gtt       1317
Pro Phe Leu Leu Arg Asn Gly Ala Asn Glu Gly Phe His Glu Ala Val
            390                 395             400


gga gaa atc atg tca ctt tct gca gct acc ccc aag cat ctg aaa tcc       1365
Gly Glu Ile Met Ser Leu Ser Ala Ala Thr Pro Lys His Leu Lys Ser
405                 410             415                 420


att ggt ctt ctg cca tcc gat ttt caa gaa gat agc gaa aca gag ata       1413
Ile Gly Leu Leu Pro Ser Asp Phe Gln Glu Asp Ser Glu Thr Glu Ile
            425                 430             435
```

```
aac ttc cta ctg aaa cag gca ttg aca att gtt gga aca cta ccg ttt      1461
Asn Phe Leu Leu Lys Gln Ala Leu Thr Ile Val Gly Thr Leu Pro Phe
        440                     445                 450

act tac atg tta gag aag tgg agg tgg atg gtc ttt cgg ggt gaa att      1509
Thr Tyr Met Leu Glu Lys Trp Arg Trp Met Val Phe Arg Gly Glu Ile
        455                     460                 465

ccc aaa gag cag tgg atg aaa aag tgg tgg gag atg aag cgg gag atc      1557
Pro Lys Glu Gln Trp Met Lys Lys Trp Trp Glu Met Lys Arg Glu Ile
        470                     475                 480

gtt ggt gtg gtg gag cct ctg cct cat gat gaa aca tac tgt gac cct      1605
Val Gly Val Val Glu Pro Leu Pro His Asp Glu Thr Tyr Cys Asp Pro
485                     490                 495                 500

gca tct ctg ttc cat gtt tct aat gat tac tca ttc att cga tat tac      1653
Ala Ser Leu Phe His Val Ser Asn Asp Tyr Ser Phe Ile Arg Tyr Tyr
                505                     510                 515

aca agg acc att tac caa ttc cag ttt caa gaa gct ctt tgt caa gca      1701
Thr Arg Thr Ile Tyr Gln Phe Gln Phe Gln Glu Ala Leu Cys Gln Ala
                520                     525                 530

gct aag tat aat ggt tct ctg cac aaa tgt gac atc tca aat tcc act      1749
Ala Lys Tyr Asn Gly Ser Leu His Lys Cys Asp Ile Ser Asn Ser Thr
        535                     540                 545

gaa gct ggg cag aag ttg ctc aag atg ctg agt ctt gga aat tca gag      1797
Glu Ala Gly Gln Lys Leu Leu Lys Met Leu Ser Leu Gly Asn Ser Glu
        550                     555                 560

ccc tgg acc aaa gcc ttg gaa aat gtg gta gga gca agg aat atg gat      1845
Pro Trp Thr Lys Ala Leu Glu Asn Val Val Gly Ala Arg Asn Met Asp
565                     570                 575                 580

gta aaa cca ctg ctc aat tac ttc caa ccg ttg ttt gac tgg ctg aaa      1893
Val Lys Pro Leu Leu Asn Tyr Phe Gln Pro Leu Phe Asp Trp Leu Lys
                585                     590                 595

gag cag aac aga aat tct ttt gtg ggg tgg aac act gaa tgg agc cca      1941
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Glu Gln Asn Arg Asn Ser Phe Val Gly Trp Asn Thr Glu Trp Ser Pro
600   605   610

tat gcc gac caa agc att aaa gtg agg ata agc cta aaa tca gct ctt   1989
Tyr Ala Asp Gln Ser Ile Lys Val Arg Ile Ser Leu Lys Ser Ala Leu
        615   620   625

gga gct aat gca tat gaa tgg acc aac aac gaa atg ttc ctg ttc cga   2037
Gly Ala Asn Ala Tyr Glu Trp Thr Asn Asn Glu Met Phe Leu Phe Arg
        630   635   640

tca tct gtt gca tat gcc atg aga aag tat ttt tca ata atc aaa aac   2085
Ser Ser Val Ala Tyr Ala Met Arg Lys Tyr Phe Ser Ile Ile Lys Asn
645   650   655   660

cag aca gtt cct ttt cta gag gaa gat gta cga gtg agc gat ttg aaa   2133
Gln Thr Val Pro Phe Leu Glu Glu Asp Val Arg Val Ser Asp Leu Lys
                665   670   675

cca aga gtc tcc ttc tac ttc ttt gtc acc tca ccc caa aat gtg tct   2181
Pro Arg Val Ser Phe Tyr Phe Phe Val Thr Ser Pro Gln Asn Val Ser
                680   685   690

gat gtc att cct aga agt gaa gtt gaa gat gcc atc agg atg tct cgg   2229
Asp Val Ile Pro Arg Ser Glu Val Glu Asp Ala Ile Arg Met Ser Arg
                695   700   705

ggc cgc atc aat gat gtc ttt ggc ctg aat gat aac agc ctg gag ttt   2277
Gly Arg Ile Asn Asp Val Phe Gly Leu Asn Asp Asn Ser Leu Glu Phe
        710   715   720

ctg ggg att cac cca aca ctt gag cca cct tac cag cct cct gtc acc   2325
Leu Gly Ile His Pro Thr Leu Glu Pro Pro Tyr Gln Pro Pro Val Thr
725   730   735   740

ata tgg ctg att att ttt ggt gtt gtg atg gca ctg gta gtg gtt ggc   2373

Ile Trp Leu Ile Ile Phe Gly Val Val Met Ala Leu Val Val Val Gly
                745   750   755

atc atc atc ctg att gtc act ggg atc aaa ggt cga aag aag aaa aat   2421

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Ile Ile Ile Leu Ile Val Thr Gly Ile Lys Gly Arg Lys Lys Lys Asn
        760             765             770

gaa aca aaa aga gaa gag aac cct tat gac tcg atg gac att gga aaa    2469
Glu Thr Lys Arg Glu Glu Asn Pro Tyr Asp Ser Met Asp Ile Gly Lys
        775             780             785

gga gaa agc aat gca gga ttc caa aac agt gat gat gct cag act tcc    2517
Gly Glu Ser Asn Ala Gly Phe Gln Asn Ser Asp Asp Ala Gln Thr Ser
        790             795             800

ttt tagcaaagca cttgtcatct tcctgtatgt aaatgctaac ttcatagtac         2570
Phe
805

acaaaatatg agagtataca catgtcatta gctatcaaaa ctatgatctg ttcagtaaac   2630
gttgtcca                                                           2638


        <210> 6
        <211> 805
        <212> PRT
        <213> Mouse


        <400> 6
Met Ser Ser Ser Ser Trp Leu Leu Leu Ser Leu Val Ala Val Thr Thr
 1               5               10              15
Ala Gln Ser Leu Thr Glu Glu Asn Ala Lys Thr Phe Leu Asn Asn Phe
             20              25              30
Asn Gln Glu Ala Glu Asp Leu Ser Tyr Gln Ser Ser Leu Ala Ser Trp
     35              40              45
Asn Tyr Asn Thr Asn Ile Thr Glu Glu Asn Ala Gln Lys Met Ser Glu
     50              55              60
Ala Ala Ala Lys Trp Ser Ala Phe Tyr Glu Glu Gln Ser Lys Thr Ala
65              70              75              80
Gln Ser Phe Ser Leu Gln Glu Ile Gln Thr Pro Ile Ile Lys Arg Gln
             85              90              95
Leu Gln Ala Leu Gln Gln Ser Gly Ser Ser Ala Leu Ser Ala Asp Lys
             100             105             110
Asn Lys Gln Leu Asn Thr Ile Leu Asn Thr Met Ser Thr Ile Tyr Ser
     115             120             125
```

Thr Gly Lys Val Cys Asn Pro Lys Asn Pro Gln Glu Cys Leu Leu Leu
130   135   140

Glu Pro Gly Leu Asp Glu Ile Met Ala Thr Ser Thr Asp Tyr Asn Ser
145   150   155   160

Arg Leu Trp Ala Trp Glu Gly Trp Arg Ala Glu Val Gly Lys Gln Leu
165   170   175

Arg Pro Leu Tyr Glu Glu Tyr Val Val Leu Lys Asn Glu Met Ala Arg
180   185   190

Ala Asn Asn Tyr Asn Asp Tyr Gly Asp Tyr Trp Arg Gly Asp Tyr Glu
195   200   205

Ala Glu Gly Ala Asp Gly Tyr Asn Tyr Asn Arg Asn Gln Leu Ile Glu
210   215   220

Asp Val Glu Arg Thr Phe Ala Glu Ile Lys Pro Leu Tyr Glu His Leu
225   230   235   240

His Ala Tyr Val Arg Arg Lys Leu Met Asp Thr Tyr Pro Ser Tyr Ile
245   250   255

Ser Pro Thr Gly Cys Leu Pro Ala His Leu Leu Gly Asp Met Trp Gly
260   265   270

Arg Phe Trp Thr Asn Leu Tyr Pro Leu Thr Val Pro Phe Ala Gln Lys
275   280   285

Pro Asn Ile Asp Val Thr Asp Ala Met Met Asn Gln Gly Trp Asp Ala
290   295   300

Glu Arg Ile Phe Gln Glu Ala Glu Lys Phe Phe Val Ser Val Gly Leu
305   310   315   320

Pro His Met Thr Gln Gly Phe Trp Ala Asn Ser Met Leu Thr Glu Pro
325   330   335

Ala Asp Gly Arg Lys Val Val Cys His Pro Thr Ala Trp Asp Leu Gly
340   345   350

His Gly Asp Phe Arg Ile Lys Met Cys Thr Lys Val Thr Met Asp Asn
355   360   365

Phe Leu Thr Ala His His Glu Met Gly His Ile Gln Tyr Asp Met Ala
370   375   380

Tyr Ala Arg Gln Pro Phe Leu Leu Arg Asn Gly Ala Asn Glu Gly Phe
385   390   395   400

His Glu Ala Val Gly Glu Ile Met Ser Leu Ser Ala Ala Thr Pro Lys
405   410   415

His Leu Lys Ser Ile Gly Leu Leu Pro Ser Asp Phe Gln Glu Asp Ser
420   425   430

Glu Thr Glu Ile Asn Phe Leu Leu Lys Gln Ala Leu Thr Ile Val Gly
435   440   445

Thr Leu Pro Phe Thr Tyr Met Leu Glu Lys Trp Arg Trp Met Val Phe
450   455   460

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Arg Gly Glu Ile Pro Lys Glu Gln Trp Met Lys Lys Trp Trp Glu Met
465             470             475             480
Lys Arg Glu Ile Val Gly Val Val Glu Pro Leu Pro His Asp Glu Thr
                485             490             495
Tyr Cys Asp Pro Ala Ser Leu Phe His Val Ser Asn Asp Tyr Ser Phe
            500             505             510
Ile Arg Tyr Tyr Thr Arg Thr Ile Tyr Gln Phe Gln Phe Gln Glu Ala
        515             520             525
Leu Cys Gln Ala Ala Lys Tyr Asn Gly Ser Leu His Lys Cys Asp Ile
        530             535             540
Ser Asn Ser Thr Glu Ala Gly Gln Lys Leu Leu Lys Met Leu Ser Leu
545             550             555             560
Gly Asn Ser Glu Pro Trp Thr Lys Ala Leu Glu Asn Val Val Gly Ala
                565             570             575
Arg Asn Met Asp Val Lys Pro Leu Leu Asn Tyr Phe Gln Pro Leu Phe
            580             585             590
Asp Trp Leu Lys Glu Gln Asn Arg Asn Ser Phe Val Gly Trp Asn Thr
        595             600             605
Glu Trp Ser Pro Tyr Ala Asp Gln Ser Ile Lys Val Arg Ile Ser Leu
    610             615             620
Lys Ser Ala Leu Gly Ala Asn Ala Tyr Glu Trp Thr Asn Asn Glu Met
625             630             635             640
Phe Leu Phe Arg Ser Ser Val Ala Tyr Ala Met Arg Lys Tyr Phe Ser
                645             650             655
Ile Ile Lys Asn Gln Thr Val Pro Phe Leu Glu Glu Asp Val Arg Val
            660             665             670
Ser Asp Leu Lys Pro Arg Val Ser Phe Tyr Phe Phe Val Thr Ser Pro
        675             680             685
Gln Asn Val Ser Asp Val Ile Pro Arg Ser Glu Val Glu Asp Ala Ile
    690             695             700
Arg Met Ser Arg Gly Arg Ile Asn Asp Val Phe Gly Leu Asn Asp Asn
705             710             715             720
Ser Leu Glu Phe Leu Gly Ile His Pro Thr Leu Glu Pro Pro Tyr Gln
            725             730             735
Pro Pro Val Thr Ile Trp Leu Ile Ile Phe Gly Val Val Met Ala Leu
            740             745             750
Val Val Val Gly Ile Ile Ile Leu Ile Val Thr Gly Ile Lys Gly Arg
        755             760             765
Lys Lys Lys Asn Glu Thr Lys Arg Glu Glu Asn Pro Tyr Asp Ser Met
    770             775             780
Asp Ile Gly Lys Gly Glu Ser Asn Ala Gly Phe Gln Asn Ser Asp Asp
785             790             795             800
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Ala Gln Thr Ser Phe
          805

      <210> 7
      <211> 2415
      <212> DNA
      <213> Artificial Sequence

      <220>
      <223> This degenerate sequence encodes the amino acid
           sequence of SEQ ID NO:6.

      <221> misc_feature
      <222> (1)...(2415)
      <223> n = A,T,C or G

      <400> 7

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acngargara aygcnaarac nttyytnaay aayttyaayc argargcnga rgayytnwsn   120
taycarwsnw snytngcnws ntggaaytay aayacnaaya thacngarga raaygcncar   180
aaratgwsng argcngcngc naartggwsn gcnttytayg argarcarws naaracngcn   240
carwsnttyw snytncarga rathcaracn ccnathatha armgncaryt ncargcnytn   300
carcarwsng gnwsnwsngc nytnwsngcn gayaaraaya arcarytnaa yacnathytn   360
aayacnatgw snacnathta ywsnacnggn aargtntgya ayccnaaraa yccncargar   420
tgyytnytny tngarccngg nytngaygar athatggcna cnwsnacnga ytayaaywsn   480
mgnytntggg cntgggargg ntggmgngcn gargtnggna arcarytnmg nccnytntay   540
gargartayg tngtnytnaa raaygaratg gcnmgngcna ayaaytayaa ygaytayggn   600
gaytaytggm gnggngayta ygargcngar ggngcngayg gntayaayta yaaymgnaay   660
carytnathg argaygtnga rmgnacntty gcngaratha arccnytnta ygarcayytn   720
caygcntayg tnmgnmgnaa rytnatggay acntayccnw sntayathws nccnacnggn   780
tgyytnccng cncayytnyt nggngayatg tggggnmgnt tytggacnaa yytntayccn   840
ytnacngtnc cnttygcnca raarccnaay athgaygtna cngaygcnat gatgaaycar   900
ggntgggayg cngarmgnat httycargar gcngaraart tyttygtnws ngtnggnytn   960
ccncayatga cncarggntt ytgggcnaay wsnatgytna cngarccngc ngayggnmgn  1020
aargtngtnt gycayccnac ngcntgggay ytnggncayg gngayttymg nathaaratg  1080
tgyacnaarg tnacnatgga yaayttyytn acngcncayc aygaratggg ncayathcar  1140
taygayatgg cntaygcnmg ncarccntty ytnytnmgna ayggngcnaa ygarggntty  1200
caygargcng tnggngarat hatgwsnytn wsngcngcna cnccnaarca yytnaarwsn  1260
athggnytny tnccnwsnga yttycargar gaywsngara cngarathaa yttyytnytn  1320
aarcargcny tnacnathgt nggnacnytn ccnttyacnt ayatgytnga raartggmgn  1380
tggatggtnt tymgnggnga rathccnaar garcartgga tgaaraartg gtgggaratg  1440
aarmgngara thgtnggngt ngtngarccn ytnccncayg aygaracnta ytgygayccn  1500
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gcnwsnytnt tycaygtnws naaygaytay wsnttyathm gntaytayac nmgnacnath    1560
taycarttyc arttycarga rgcnytntgy cargcngcna artayaaygg nwsnytncay    1620
aartgygaya thwsnaayws nacngargcn ggncaraary tnytnaarat gytnwsnytn    1680
ggnaaywsng arccntggac naargcnytn garaaygtng tnggngcnmg naayatggay    1740
gtnaarccny tnytnaayta yttycarccn ytnttygayt ggytnaarga rcaraaymgn   1800
aaywsnttyg tnggntggaa yacngartgg wsnccntayg cngaycarws nathaargtn    1860
mgnathwsny tnaarwsngc nytnggngcn aaygcntayg artggacnaa yaaygaratg    1920
ttyytnttym gnwsnwsngt ngcntaygcn atgmgnaart ayttywsnat hathaaraay    1980
caracngtnc cnttyytnga rgargaygtn mgngtnwsng ayytnaarcc nmgngtnwsn    2040
ttytayttyt tygtnacnws nccncaraay gtnwsngayg tnathccnmg nwsngargtn    2100
gargaygcna thmgnatgws nmgnggnmgn athaaygayg tnttyggnyt naaygayaay   2160
wsnytngart tyytnggnat hcayccnacn ytngarccnc cntaycarcc nccngtnacn    2220
athtggytna thathttygg ngtngtnatg gcnytngtng tngtnggnat hathathytn   2280
athgtnacng gnathaargg nmgnaaraar aaraaygara cnaarmgnga rgaraayccn   2340
taygaywsna tggayathgg naarggngar wsnaaygcng gnttycaraa ywsngaygay    2400
                                                                    2415
gcncaracnw sntty
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<211> 2638
<212> DNA
<213> Mouse

<220>
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tagggaaagt tgctcagtgg atgggatctt ggcgcacggg gaaag atg tcc agc tcc    117
                                                  Met Ser Ser Ser
                                                   1

tcc tgg ctc ctt ctc agc ctt gtt gct gtt act act gct cag tcc ctc     165
Ser Trp Leu Leu Leu Ser Leu Val Ala Val Thr Thr Ala Gln Ser Leu
5                   10                  15                  20

acc gag gaa aat gcc aag aca ttt tta aac aac ttt aat cag gag gct     213
Thr Glu Glu Asn Ala Lys Thr Phe Leu Asn Asn Phe Asn Gln Glu Ala
                25                  30                  35

gaa gac ctg tct tat caa agt tca ctt gct tct tgg aat tat aat act     261
Glu Asp Leu Ser Tyr Gln Ser Ser Leu Ala Ser Trp Asn Tyr Asn Thr
            40                  45                  50
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aac att act gaa gaa aat gcc caa aag atg agt gag gct gca gcc aaa        309
Asn Ile Thr Glu Glu Asn Ala Gln Lys Met Ser Glu Ala Ala Ala Lys
         55                  60                  65

tgg tct gcc ttt tat gaa gaa cag tct aag act gcc caa agt ttc tca        357
Trp Ser Ala Phe Tyr Glu Glu Gln Ser Lys Thr Ala Gln Ser Phe Ser
     70                  75                  80

cta caa gaa atc cag act ccg atc atc aag cgt caa cta cag gcc ctt        405
Leu Gln Glu Ile Gln Thr Pro Ile Ile Lys Arg Gln Leu Gln Ala Leu
     85                  90                  95                 100

cag caa agt ggg tct tca gca ctc tca gca gac aag aac aaa cag ttg        453
Gln Gln Ser Gly Ser Ser Ala Leu Ser Ala Asp Lys Asn Lys Gln Leu
                105                 110                 115

aac aca att ctg aac acc atg agc acc att tac agt act gga aaa gtt        501
Asn Thr Ile Leu Asn Thr Met Ser Thr Ile Tyr Ser Thr Gly Lys Val
                120                 125                 130

tgc aac cca agg aac cca caa gaa tgc tta tta ctt gag cca gga ttg        549
Cys Asn Pro Arg Asn Pro Gln Glu Cys Leu Leu Leu Glu Pro Gly Leu
                135                 140                 145

gat gaa ata atg gcg aca agc aca gac tac aac tct agg ctc tgg gca        597
Asp Glu Ile Met Ala Thr Ser Thr Asp Tyr Asn Ser Arg Leu Trp Ala
     150                 155                 160

tgg gag ggc tgg agg gct gag gtt ggc aag cag ctg agg ccg ttg tat        645
Trp Glu Gly Trp Arg Ala Glu Val Gly Lys Gln Leu Arg Pro Leu Tyr
165                 170                 175                 180

gaa gag tat gtg gtc ctg aaa aac gag atg gca aga gca aac aat tat        693
Glu Glu Tyr Val Val Leu Lys Asn Glu Met Ala Arg Ala Asn Asn Tyr
                185                 190                 195

aac gac tat ggg gat tat tgg aga ggg gac tat gaa gca gag gga gca        741
Asn Asp Tyr Gly Asp Tyr Trp Arg Gly Asp Tyr Glu Ala Glu Gly Ala
                200                 205                 210

gat ggc tac aac tat aac cgt aac cag ttg att gaa gat gta gaa cgt        789
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Asp Gly Tyr Asn Tyr Asn Arg Asn Gln Leu Ile Glu Asp Val Glu Arg
     215   220   225

acc ttc gca gag atc aag cca ttg tat gag cat ctt cat gcc tat gtg   837
Thr Phe Ala Glu Ile Lys Pro Leu Tyr Glu His Leu His Ala Tyr Val
     230   235   240

agg agg aag ttg atg gat acc tac cct tcc tac atc agc ccc act gga   885
Arg Arg Lys Leu Met Asp Thr Tyr Pro Ser Tyr Ile Ser Pro Thr Gly
 245   250   255   260

tgc ctc cct gcc cat ttg ctt ggt gat atg tgg ggt aga ttt tgg aca   933

Cys Leu Pro Ala His Leu Leu Gly Asp Met Trp Gly Arg Phe Trp Thr
          265   270   275

aat ctg tac cct ttg act gtt ccc ttt gca cag aaa cca aac ata gat   981
Asn Leu Tyr Pro Leu Thr Val Pro Phe Ala Gln Lys Pro Asn Ile Asp
          280   285   290

gtt act gat gca atg atg aat cag ggc tgg gat gca gaa agg ata ttt   1029
Val Thr Asp Ala Met Met Asn Gln Gly Trp Asp Ala Glu Arg Ile Phe
          295   300   305

caa gag gca gag aaa ttc ttt gtt tct gtt ggc ctt cct cat atg act   1077
Gln Glu Ala Glu Lys Phe Phe Val Ser Val Gly Leu Pro His Met Thr
   310   315   320

caa gga ttc tgg gca aac tct atg ctg act gag cca gca gat ggc cgg   1125
Gln Gly Phe Trp Ala Asn Ser Met Leu Thr Glu Pro Ala Asp Gly Arg
 325   330   335   340

aaa gtt gtc tgc cac ccc aca gct tgg gat ctg gga cac gga gac ttc   1173
Lys Val Val Cys His Pro Thr Ala Trp Asp Leu Gly His Gly Asp Phe
          345   350   355

aga atc aag atg tgt aca aag gtc aca atg gac aac ttc ttg aca gcc   1221
Arg Ile Lys Met Cys Thr Lys Val Thr Met Asp Asn Phe Leu Thr Ala
          360   365   370

cat cac gag atg gga cac atc caa tat gac atg gca tat gcc agg caa   1269

His His Glu Met Gly His Ile Gln Tyr Asp Met Ala Tyr Ala Arg Gln
    375   380   385

cct ttc ctg cta aga aac gga gcc aat gaa ggg ttc cat gaa gct gtt   1317
Pro Phe Leu Leu Arg Asn Gly Ala Asn Glu Gly Phe His Glu Ala Val
    390   395   400

gga gaa atc atg tca ctt tct gca gct acc ccc aag cat ctg aaa tcc   1365
Gly Glu Ile Met Ser Leu Ser Ala Ala Thr Pro Lys His Leu Lys Ser
405   410   415   420

att ggt ctt ctg cca tcc gat ttt caa gaa gat agc gaa aca gag ata   1413
Ile Gly Leu Leu Pro Ser Asp Phe Gln Glu Asp Ser Glu Thr Glu Ile
             425   430   435

aac ttc cta ctg aaa cag gca ttg aca att gtt gga aca cta ccg ttt   1461

Asn Phe Leu Leu Lys Gln Ala Leu Thr Ile Val Gly Thr Leu Pro Phe
           440   445   450

act tac atg tta gag aag tgg agg tgg atg gtc ttt cgg ggt gaa att   1509
Thr Tyr Met Leu Glu Lys Trp Arg Trp Met Val Phe Arg Gly Glu Ile
         455   460   465

ccc aaa gag cag tgg atg aaa aag tgg tgg gag atg aag cgg gag atc   1557
Pro Lys Glu Gln Trp Met Lys Lys Trp Trp Glu Met Lys Arg Glu Ile
        470   475   480

gtt ggt gtg gtg gag cct ctg cct cgt gat gaa aca tac tgt gac cct   1605
Val Gly Val Val Glu Pro Leu Pro Arg Asp Glu Thr Tyr Cys Asp Pro
485   490   495   500

gca tct ctg ttc cat gtt tct aat gat tac tca ttc att cga tat tac   1653
Ala Ser Leu Phe His Val Ser Asn Asp Tyr Ser Phe Ile Arg Tyr Tyr
           505   510   515

aca agg acc att tac caa ttc cag ttt caa gaa gct ctt tgt caa gca   1701
Thr Arg Thr Ile Tyr Gln Phe Gln Phe Gln Glu Ala Leu Cys Gln Ala
           520   525   530

gct aag tat aat ggt tct ctg cac aaa tgt gac atc tca aat tcc act   1749

Ala Lys Tyr Asn Gly Ser Leu His Lys Cys Asp Ile Ser Asn Ser Thr
    535   540   545

gaa gct ggg cag aag ttg ctc aag atg ctg agt ctt gga aat tca gag   1797
Glu Ala Gly Gln Lys Leu Leu Lys Met Leu Ser Leu Gly Asn Ser Glu
    550   555   560

ccc tgg acc gaa gcc ttg gaa aat gtg gta gga gca agg aat atg gat   1845
Pro Trp Thr Glu Ala Leu Glu Asn Val Val Gly Ala Arg Asn Met Asp
565   570   575   580

gta aaa cca ctg ctc aat tac ttc caa ccg ttg ttt gac tgg ctg aaa   1893
Val Lys Pro Leu Leu Asn Tyr Phe Gln Pro Leu Phe Asp Trp Leu Lys
         585   590   595

gag cag aac aga aat tct ttt gtg ggg tgg aac act gaa tgg agc cca   1941
Glu Gln Asn Arg Asn Ser Phe Val Gly Trp Asn Thr Glu Trp Ser Pro
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tat gcc gac caa agc att aaa gtg agg ata agc cta aaa tca gct ctt   1989

Tyr Ala Asp Gln Ser Ile Lys Val Arg Ile Ser Leu Lys Ser Ala Leu
      615   620   625

gga gct aat gca tat gaa tgg acc aac aac gaa atg ttc ctg ttc cga   2037
Gly Ala Asn Ala Tyr Glu Trp Thr Asn Asn Glu Met Phe Leu Phe Arg
    630   635   640

tca tct gtt gca tat gcc atg aga aag tat tct tca ata atc aaa aac   2085
Ser Ser Val Ala Tyr Ala Met Arg Lys Tyr Ser Ser Ile Ile Lys Asn
645   650   655   660

cag aca gtt cct ttt cta gag gaa gat gta cga gtg agt gat ttg aaa   2133
Gln Thr Val Pro Phe Leu Glu Glu Asp Val Arg Val Ser Asp Leu Lys
         665   670   675

cca aga gtc tcc ttc tac ttc ttt gtc acc tca ccc caa aat gtg tct   2181
Pro Arg Val Ser Phe Tyr Phe Phe Val Thr Ser Pro Gln Asn Val Ser
         680   685   690

gat gtc att cct aga agt gaa gtt gaa gat gcc atc agg atg tct cgg   2229

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Asp Val Ile Pro Arg Ser Glu Val Glu Asp Ala Ile Arg Met Ser Arg
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ggc cgc atc aat gat gtc ttt ggc ctg aat gat aac agc ctg gag ttt    2277
Gly Arg Ile Asn Asp Val Phe Gly Leu Asn Asp Asn Ser Leu Glu Phe
        710             715             720


ctg ggg att cac cca aca ctt gag cca cct tac cag cct cct gtc acc    2325
Leu Gly Ile His Pro Thr Leu Glu Pro Pro Tyr Gln Pro Pro Val Thr
725             730             735             740


ata tgg ctg att att ttt ggt gtt gtg atg gca ctg gta gtg gtt ggc    2373
Ile Trp Leu Ile Ile Phe Gly Val Val Met Ala Leu Val Val Val Gly
                745             750             755


atc atc atc ctg att gtc act ggg atc aaa ggt cga aag aag aaa aat    2421
Ile Ile Ile Leu Ile Val Thr Gly Ile Lys Gly Arg Lys Lys Lys Asn
                760             765             770


gaa aca aaa aga gaa gag aac cct tat gac tcg atg gac att gga aaa    2469
Glu Thr Lys Arg Glu Glu Asn Pro Tyr Asp Ser Met Asp Ile Gly Lys
            775             780             785


gga gaa agc aat gca gga ttc caa aac agt gat gat gct cag act tcc    2517


Gly Glu Ser Asn Ala Gly Phe Gln Asn Ser Asp Asp Ala Gln Thr Ser
        790             795             800


ttt tagcaaagca cttgtcatct tcctgtatgt aaatgctaac ttcatagtac    2570
Phe
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Asn Gln Glu Ala Glu Asp Leu Ser Tyr Gln Ser Ser Leu Ala Ser Trp
        35              40                  45
Asn Tyr Asn Thr Asn Ile Thr Glu Glu Asn Ala Gln Lys Met Ser Glu
    50              55                  60
Ala Ala Ala Lys Trp Ser Ala Phe Tyr Glu Glu Gln Ser Lys Thr Ala
65              70                  75                  80
Gln Ser Phe Ser Leu Gln Glu Ile Gln Thr Pro Ile Ile Lys Arg Gln
            85                  90                  95
Leu Gln Ala Leu Gln Gln Ser Gly Ser Ser Ala Leu Ser Ala Asp Lys
            100             105                 110
Asn Lys Gln Leu Asn Thr Ile Leu Asn Thr Met Ser Thr Ile Tyr Ser
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Thr Gly Lys Val Cys Asn Pro Arg Asn Pro Gln Glu Cys Leu Leu Leu
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Glu Pro Gly Leu Asp Glu Ile Met Ala Thr Ser Thr Asp Tyr Asn Ser
145             150                 155                 160
Arg Leu Trp Ala Trp Glu Gly Trp Arg Ala Glu Val Gly Lys Gln Leu
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Arg Pro Leu Tyr Glu Glu Tyr Val Val Leu Lys Asn Glu Met Ala Arg
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Ala Asn Asn Tyr Asn Asp Tyr Gly Asp Tyr Trp Arg Gly Asp Tyr Glu
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Ala Glu Gly Ala Asp Gly Tyr Asn Tyr Asn Arg Asn Gln Leu Ile Glu
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Asp Val Glu Arg Thr Phe Ala Glu Ile Lys Pro Leu Tyr Glu His Leu
225             230                 235                 240
His Ala Tyr Val Arg Arg Lys Leu Met Asp Thr Tyr Pro Ser Tyr Ile
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Ser Pro Thr Gly Cys Leu Pro Ala His Leu Leu Gly Asp Met Trp Gly
            260             265                 270
Arg Phe Trp Thr Asn Leu Tyr Pro Leu Thr Val Pro Phe Ala Gln Lys
            275             280                 285
Pro Asn Ile Asp Val Thr Asp Ala Met Met Asn Gln Gly Trp Asp Ala
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Glu Arg Ile Phe Gln Glu Ala Glu Lys Phe Phe Val Ser Val Gly Leu
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Pro His Met Thr Gln Gly Phe Trp Ala Asn Ser Met Leu Thr Glu Pro
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Ala Asp Gly Arg Lys Val Val Cys His Pro Thr Ala Trp Asp Leu Gly
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His Gly Asp Phe Arg Ile Lys Met Cys Thr Lys Val Thr Met Asp Asn
             355             360                 365
Phe Leu Thr Ala His His Glu Met Gly His Ile Gln Tyr Asp Met Ala
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Tyr Ala Arg Gln Pro Phe Leu Leu Arg Asn Gly Ala Asn Glu Gly Phe
385             390             395                 400
His Glu Ala Val Gly Glu Ile Met Ser Leu Ser Ala Ala Thr Pro Lys
             405             410                 415
His Leu Lys Ser Ile Gly Leu Leu Pro Ser Asp Phe Gln Glu Asp Ser
             420             425                 430
Glu Thr Glu Ile Asn Phe Leu Leu Lys Gln Ala Leu Thr Ile Val Gly
             435             440                 445
Thr Leu Pro Phe Thr Tyr Met Leu Glu Lys Trp Arg Trp Met Val Phe
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Arg Gly Glu Ile Pro Lys Glu Gln Trp Met Lys Lys Trp Trp Glu Met
465             470             475                 480
Lys Arg Glu Ile Val Gly Val Val Glu Pro Leu Pro Arg Asp Glu Thr
             485             490                 495
Tyr Cys Asp Pro Ala Ser Leu Phe His Val Ser Asn Asp Tyr Ser Phe
         500             505             510
Ile Arg Tyr Tyr Thr Arg Thr Ile Tyr Gln Phe Gln Phe Gln Glu Ala
             515             520                 525
Leu Cys Gln Ala Ala Lys Tyr Asn Gly Ser Leu His Lys Cys Asp Ile
         530             535             540
Ser Asn Ser Thr Glu Ala Gly Gln Lys Leu Leu Lys Met Leu Ser Leu
545             550             555                 560
Gly Asn Ser Glu Pro Trp Thr Glu Ala Leu Glu Asn Val Val Gly Ala
             565             570                 575
Arg Asn Met Asp Val Lys Pro Leu Leu Asn Tyr Phe Gln Pro Leu Phe
             580             585                 590
Asp Trp Leu Lys Glu Gln Asn Arg Asn Ser Phe Val Gly Trp Asn Thr
         595             600             605
Glu Trp Ser Pro Tyr Ala Asp Gln Ser Ile Lys Val Arg Ile Ser Leu
         610             615             620
Lys Ser Ala Leu Gly Ala Asn Ala Tyr Glu Trp Thr Asn Asn Glu Met
625             630             635                 640
Phe Leu Phe Arg Ser Ser Val Ala Tyr Ala Met Arg Lys Tyr Ser Ser
             645             650                 655
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Ile Ile Lys Asn Gln Thr Val Pro Phe Leu Glu Glu Asp Val Arg Val
         660   665   670

Ser Asp Leu Lys Pro Arg Val Ser Phe Tyr Phe Phe Val Thr Ser Pro
         675   680   685

Gln Asn Val Ser Asp Val Ile Pro Arg Ser Glu Val Glu Asp Ala Ile
         690   695   700

Arg Met Ser Arg Gly Arg Ile Asn Asp Val Phe Gly Leu Asn Asp Asn
705   710   715   720

Ser Leu Glu Phe Leu Gly Ile His Pro Thr Leu Glu Pro Pro Tyr Gln
            725   730   735

Pro Pro Val Thr Ile Trp Leu Ile Ile Phe Gly Val Val Met Ala Leu
         740   745   750

Val Val Val Gly Ile Ile Ile Leu Ile Val Thr Gly Ile Lys Gly Arg
         755   760   765

Lys Lys Lys Asn Glu Thr Lys Arg Glu Glu Asn Pro Tyr Asp Ser Met
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